

What is claimed is:

CLAIMS

1. An article of manufacture comprising a contact-killing, non-leaching antimicrobial coating which kills microorganisms upon contact, said coating comprising an organic matrix immobilized on the surface having dispersed therein or attached thereto a surface-accessible antimicrobial material.
2. The article of claim 1 wherein the antimicrobial material is a metallic material selected from the group consisting of a metal, a metal oxide, a metal salt, a metal complex, a metal alloy, and mixtures thereof.
3. The article of claim 2 wherein said metal, metal oxide, metal salt, metal complex, or metal alloy is respectively silver, a silver oxide, a silver salt, a silver complex or a silver alloy.
4. The article of claim 2 wherein the metallic material is silver iodide.
5. The article of claim 1 wherein said organic matrix is formed from a compound selected from the group consisting of cationic compounds, polycationic compounds, anionic compounds, polyanionic compounds, non-ionic compounds, polymeric non-ionic compounds and zwitterionic compounds.
6. The article of claim 5 wherein the cationic compound is selected from the group consisting of benzalkonium derivatives and biguanide compounds.

7. The article of claim 6 wherein the biguanide compound is polyhexamethylene biguanide or a chain extended derivative thereof, or a polymer containing a biguanide compound as a side chain substituent.
8. The article of claim 7 wherein the organic matrix is crosslinked with a crosslinking agent.
9. The article of claim 8 wherein said crosslinking agent is selected from a group consisting of organic multifunctional groups including isocyanates, epoxides, carboxylic acids, acid chlorides, acid anhydrides, succimidyl ethers aldehydes, ketones, alkyl methanesulfonates, alkyl trifluoromethanesulfonates, alkyl para-toluenemethanesulfonates, alkyl halides and organic multifunctional epoxides.
10. The article of claim 9 wherein said crosslinking agent is N,N-bismethylene diglycidylaniline.
11. The article of claim 1 wherein the metallic material is transferred to or taken up by the microorganism when the microorganism contacts the surface.
12. The article of claim 1 comprising a medical device, personal care product or a consumer product.
13. The article of claim 12 comprising a medical device selected from the group consisting of surgical gloves, surgical instruments, dental care instruments, dental consoles, instrument trays, catheters, urological devices, blood

collection and transferring devices, devices for implanting in a patient, urine collection devices, ophthalmic devices, intraocular lenses, tracheotomy devices, topical disinfectants and wound dressings.

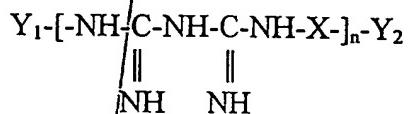
14. The article of claim 12 comprising a personal care product selected from the group consisting of hair care items, toothbrushes, dental floss, dental implements, contact lenses, contact lens storage cases, baby care items, child care items, bathroom implements, bed linens, towels and wash cloths.

15. The article of claim 12 comprising a consumer product selected from the group consisting of kitchen implements, trash containers, disposable trash bags and cutting boards.

16. A method of killing microorganisms comprising the steps of:
providing a substrate having adhered thereto an organic matrix impregnated with toxic metal ions to form a toxic metal ion/organic matrix which inhibits leaching of the toxic metal ions from the adhered matrix into an ambient aqueous solution; and
inducing contact between the matrix and the microorganism to permit selective transfer of toxic metal ions into the microorganism in an amount sufficient to kill the microorganism.

17. The method of claim 16 wherein the toxic metal material is selected from the group consisting of a metal, a metal oxide, a metal salt, a metal complex, a metal alloy, and combinations thereof.

18. The method of claim 17 wherein the metal is silver.
19. The method of claim 17 wherein said metal salt is silver halide.
20. The method of claim 16 wherein the organic material is a biguanide compound having the formula:



wherein X comprises an aliphatic, cycloaliphatic, aromatic, substituted aromatic, heteroaliphatic, heterocyclic or heteroaromatic group; and

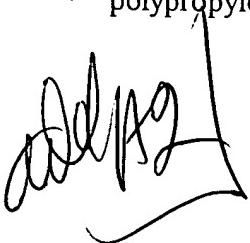
wherein Y1 and Y2 independently comprise an aliphatic, cycloaliphatic, aromatic, substituted aromatic, heteroaliphatic, heterocyclic or heteroaromatic group; and n is an integer equal to or greater than 1.

21. The method of claim 20 wherein the biguanide compound comprises chlorhexidine, polyhexamethylene biguanide or derivatives thereof.

22. The method of claim 16 wherein the matrix further comprises a crosslinking agent selected from the group consisting of organic multifunctional groups including isocyanates, epoxides, carboxylic acids, acid chlorides, acid anhydrides, succimidyl ethers, aldehydes, ketones, alkyl methanesulfonates, alkyl trifluoromethanesulfonates, alkyl para-toluenemethanesulfonates, alkyl halides and organic multifunctional epoxides.

23. The method of claim 16 wherein the substrate is selected from the group consisting of metal, wood, synthetic polymers, natural and synthetic fibers, cloth, paper, rubbers, and glass.

24. The method of claim 23 wherein said substrate is formed from a plastic selected from the group consisting of polysulfone, polyacrylate, polyethersulfone, polyamide, polycarbonate, polyvinylidene fluoride, polyethylene, polypropylene and cellulosics.

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